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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/646,292	08/22/2003	Oksana Penezina	57315 (45858)	9380
21874	7590	06/27/2006	EXAMINER	
EDWARDS & ANGELL, LLP			VO, HAI	
P.O. BOX 55874			ART UNIT	PAPER NUMBER
BOSTON, MA 02205			1771	

DATE MAILED: 06/27/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/646,292

Applicant(s)

PENEZINA ET AL.

Examiner

Hai Vo

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 11 April 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-22,48 and 49 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-22,48 and 49 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

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1. The 112 claim rejections are withdrawn in view of the present amendment.
2. The art rejections over Steuck et al (US 4,618,533) and Wang et al (US 5,137,633) separately are maintained.
3. The art rejections over Ying et al (US 6,183, 901) have been withdrawn in view of the present response. Ying teaches a composite porous membrane comprising a microporous pseudo-boehmite substrate made from hydrated aluminum oxide having the chemical formula  $Al_2O_3 \cdot xH_2O$ , which is not a hydrophobic substrate as set forth in the claims. However, upon further consideration, new ground of rejection is made in view of newly discovered reference of Callahan et al (US 4,976,897).

#### ***Drawings***

4. The drawings were received on 01/10/2006. These drawings are acceptable.

#### ***Claim Rejections - 35 USC § 102***

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

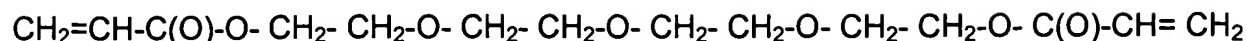
#### ***Claim Rejections - 35 USC § 103***

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

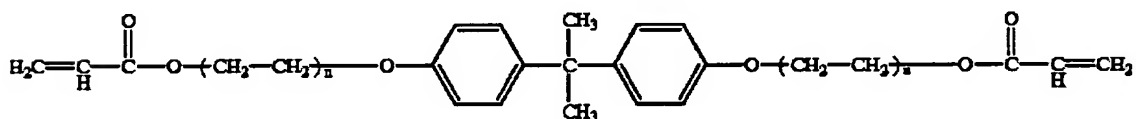
(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 1-6, 9-14, 19-22, 48 and 49 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Steuck et al (US 4,618,533) substantially as set forth in the 11/10/2005 Office Action. Note that polyethylene glycol diacrylate is not capable of a significant preferential association with the hydrophobic substrate in accordance with the teachings of the present invention. However, the term "significant" is a relative term and is not defined by the specification to provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably appraised of the scope of the invention. Therefore, the reciting "capable of significant association with the substrate" does not differentiate the claimed difunctional surface modifying molecule from a prior art polyethylene glycol diacrylate satisfying the claimed structural limitations, i.e., a hydrophobic portion of CH<sub>2</sub> groups and a hydrophilic portion of a carbon-carbon double bond. Steuck discloses the entire exposed surface of the porous membrane being coated with a polymeric coating without plugging of the pores of the membrane (column 5, lines 3-5). Likewise, the pore size of the membrane before and after coating is substantially the same. Steuck discloses the membrane is autoclavable (column 5, lines 50-55). The membrane is wettable within less than 5 sec (table 6). Applicants argue that the tetraethylene glycol diacrylate does not contain a hydrophobic portion as recited in claim 1. The examiner respectfully disagrees. As shown in the formula for tetraethylene glycol provided by Applicants in the amendment filed on 04/11/2006,

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the CH<sub>2</sub> groups which are surrounded with oxygens read on Applicants' hydrophobic alkyl. The CH<sub>2</sub> groups possess a hydrophobic anchor that has some degrees of preferential adsorption on the hydrophobic substrate. This is consistent with the teachings of Applicants' disclosure (paragraph 87 of the present specification). The examiner directs Applicants' attention to the formula for ethoxylated bisphenol diacrylate as follows:



The bisphenol group surrounded by the oxygens in ethoxylated bisphenol diacrylate has a hydrophobic anchor that is capable of preferential absorption on the hydrophobic substrate. Therefore, it is not seen that the CH<sub>2</sub> groups surrounded by the oxygens in tetraethylene glycol could not have a hydrophobic anchor that is capable of preferential absorption on the hydrophobic substrate. While it is true that the tetraethylene glycol diacrylate is a hydrophilic molecule, it does not necessarily indicate that the tetraethylene glycol diacrylate could not have a hydrophobic portion within its molecules. Since the "hydrophobic" difunctional surface modifying molecule is not presently claimed, the difunctional surface modifying molecule as claimed does not exclude the tetraethylene glycol diacrylate. The SEM photographs showing Applicants' coatings filed on

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01/10/2006 have been reviewed and fully considered. However, they are not sufficient to overcome the art rejections because they do not compare the coated composite membranes of the present invention and those of the closest prior art. Since SEM pictures are not related to the Steuck membrane, the showing does not provide the structural differences between the membranes of Stuck and those of Applicants. Accordingly, the art rejections are sustained.

8. Claims 1-6, 9-14, 16-22, 48 and 49 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Wang et al (US 5,137,633) substantially as set forth in the 11/10/2005 Office Action. The art rejections have been maintained for the same reasons as set forth above regarding Steuck.
9. Claims 1-19, 21, 22, 48 and 49 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Callahan et al (US 4,976,897). Callahan teaches a composite porous membrane comprising a hydrophobic substrate coated with difunctional surface-modifying molecules. The hydrophobic substrate is polyethylene membrane having a pore size of 0.02 to 0.04  $\mu\text{m}$  (column 3, lines 30-35). The difunctional surface-modifying molecule comprises ethoxylated bisphenol A diacrylate (column 4, lines 20-21). The photocatalyst is 2-hydroxyl-2-methyl-1-phenyl-propan-1-one (column 3, lines 62-63). Callahan discloses the use of acrylic acid as a hydrophilic monomer, which reads on Applicants' negatively charged group. Callahan discloses the use of dimethylaminoethyl methacrylate as a hydrophilic

monomer, which reads on Applicants' positively charged group. There is no pore plugging upon coating and curing (abstract). Since Callahan was using the same material for the difunctional surface modifying molecule as Applicants, it is the examiner's position that the preferential association, wetting characteristics would be inherently present. Callahan does not specifically disclose the membrane is autoclavable. However, it is a product-by-process limitation not as yet shown to produce a patentably distinct article. It is the examiner's position that the article of Callahan is identical to or only slightly different than the claimed article prepared by the method of the claim, because both articles are formed from the same materials, having structural similarity as discussed above. Even though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or an obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process. *In re Thorpe*, 227 USPQ 964, 966 (Fed. Cir. 1985). The burden has been shifted to the applicant to show unobvious differences between the claimed product and the prior art product. *In re Marosi*, 218 USPQ 289,291 (Fed. Cir. 1983). It is noted that if the applicant intends to rely on Examples in the specification or in a submitted Declaration to show non-obviousness, the applicant should clearly state how the Examples of the present invention are commensurate in scope with the claims and how the Comparative Examples are

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commensurate in scope with the membrane of Callahan. Accordingly, Callahan anticipates or strongly suggests the claimed subject matter.

10. Claim 19 is rejected under 35 U.S.C. 103(a) as being unpatentable over Callahan et al (US 4,976,897) as applied to claim 1 above, and further in view of Steuck et al (US 4,618,533). Callahan does not specifically disclose the microporous substrate being polyvinylidene fluoride. Steuck, however, teaches a porous membrane for use in separation comprising a porous membrane including polyethylene and polyvinylidene fluoride (column 2, lines 60-65). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to substitute polyvinylidene fluoride for the polyethylene of the Steuck invention since two polymers have been shown in the art to be recognized equivalent porous membranes in separation processes.

### ***Conclusion***

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hai Vo whose telephone number is (571) 272-1485. The examiner can normally be reached on Monday through Thursday, from 9:00 to 6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Terrel Morris can be reached on (571) 272-1478. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.



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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

HV

*Hai Vo*

**HAIVO  
PRIMARY EXAMINER**